

### **3.3.7.2 Floodplain Forest**

#### **3.3.7.2.1 Community Overview**

This lowland hardwood forest community type occurs along large rivers, usually of Stream Order 3 or higher. Most of these rivers originate in northern Wisconsin and flow southward, growing in size as the volume of water they carry increases. As the stream gradients diminish, the floodplains become broader. Periodic floods, particularly in the spring, are the key natural disturbance event to which species of this community are adapted. Silt deposition and development of microtopography during flood events creates suitable sites for tree germination and establishment, and floods also carry seeds and propagules of plant species. The most extensive occurrences of floodplain forest are found along the large rivers of southern Wisconsin, but the community also occurs at scattered locations in the north. The type was uncommon historically, occupying only about 3% of the Western Coulees and Ridges Ecological Landscape and even smaller percentages of other Ecological Landscapes (Finley 1976). Canopy dominants vary, but may include silver maple, river birch, green and black ashes, hackberry, swamp white oak, and eastern cottonwood. Black willow, basswood, red oak, and red maple are associated tree species found in these forests. Historically, the elms were highly significant components of the floodplain forests, but Dutch elm disease has eliminated most large elm trees that formerly provided supercanopy structure, snag and den sites, and large woody debris. Northern occurrences of this type tend to be less extensive, are often discontinuous, and are relatively species-poor compared to those in the south. Silver maple and green ash remain among the dominant species, with balsam-poplar, bur oak, and box elder replacing some of the many missing southern trees.

Understory composition is also quite variable, and follows the pattern exhibited by the canopy species, with the most extensive stands and highest plant species diversity occurring in southwestern Wisconsin. Buttonbush is a locally dominant shrub that may form dense thickets on the margins of oxbow lakes, sloughs and ponds, which are often important aquatic habitats within these forests. Wood nettle, stinging nettle, sedges (e.g., *Carex grayii*, *C. lupulina*, *C. hystericina*, *C. tuckermanii*), native grasses (e.g., *Cinna arundinacea*, *Elymus villosus*, *Leersia virginica*), ostrich fern and green-headed coneflower are important understory herbs, and lianas such as Virginia creepers, grapes, Canada moonseed, and poison-ivy are often common. Among the more striking herbs of this community are cardinal flower, fringed loosestrife, and green dragon.

The sprawling floodplains found along the largest rivers sometimes consist of several terraces capable of supporting forests. These are subject to floods with differing frequencies and levels of inundation, and support patches of varying floristic composition depending upon local elevation differences, edaphic factors, and disturbance history. The lower terraces experience the most frequent, severe, and long-lasting floods; the uppermost terraces flood infrequently, and the rich alluvial soils can support mesophytic trees species and rich groundlayers similar to those of the mesic hardwood forests.

#### **3.3.7.2.2 Vertebrate Species of Greatest Conservation Need for Floodplain Forest**

Thirty-five vertebrate Species of Greatest Conservation Need were identified as moderately or significantly associated with floodplain forest (Table 3-145).

**Table 3-145. Vertebrate Species of Greatest Conservation Need that are (or historically were) moderately or significantly associated with floodplain forest communities.**

<b><i>Species Significantly Associated with Floodplain Forest</i></b>
<b>Birds</b>
Yellow-Crowned Night-heron
Red-shouldered Hawk
Solitary Sandpiper
Yellow-billed Cuckoo
Yellow-throated Warbler
Cerulean Warbler
Prothonotary Warbler
Kentucky Warbler
Rusty Blackbird
<b>Herptiles</b>
Four-toed Salamander
Wood Turtle
Eastern Massasauga Rattlesnake
<b><i>Species Moderately Associated with Floodplain Forest</i></b>
<b>Birds</b>
Great Egret
Blue-winged Teal
Black-billed Cuckoo
Red-headed Woodpecker
Acadian Flycatcher
Least Flycatcher
Veery
Wood Thrush
Blue-winged Warbler
<b>Herptiles</b>
Pickerel Frog
Blanding's Turtle
Black Rat Snake
Butler's Garter Snake
Timber Rattlesnake
<b>Mammals</b>
Water Shrew
Northern Long-eared Bat
Silver-haired Bat
Eastern Red Bat
Hoary Bat
Northern Flying Squirrel
Woodland Jumping Mouse
Gray Wolf
Moose

In order to provide a framework for decision-makers to set priorities for conservation actions, the species identified in Table 3-145 were subject to further analysis. The additional analysis identified the best opportunities, by Ecological Landscape, for protection, restoration, and/or management of both floodplain forest and associated vertebrate Species of Greatest Conservation Need. The steps of this analysis were:

- Each species was examined relative to its probability of occurrence in each of the 16 Ecological Landscapes in Wisconsin. This information was then cross-referenced with the opportunity for protection, restoration, and/or management of floodplain forest in each of the Ecological Landscapes (Tables 3-146 and 3-147).
- Using the analysis described above, a species was further selected if it had both a significant association with floodplain forest and a high probability of occurring in an Ecological Landscape(s) that represents a major opportunity for protection, restoration and/or management of floodplain forest. These species are shown in Figure 3-34.

Table 3-146. Vertebrate Species of Greatest Conservation Need that are (or historically were) *significantly* associated with floodplain forest communities and their association with Ecological Landscapes that support floodplain forest.

Floodplain Forest	Birds (9)*									Herpetiles (3)		
	Yellow-crowned Night-Heron	Red-shouldered Hawk	Solitary Sandpiper	Yellow-billed Cuckoo	Yellow-throated Warbler	Cerulean Warbler	Prothonotary Warbler	Kentucky Warbler	Rusty Blackbird	Four-toed Salamander	Wood Turtle	Eastern Massasauga Rattlesnake
MAJOR												
Central Sand Plains												
Southeast Glacial Plains												
Western Coulee and Ridges												
IMPORTANT												
Central Lake Michigan Coastal												
Central Sand Hills												
Forest Transition												
North Central Forest												
Northern Lake Michigan Coastal												
Superior Coastal Plain												
Western Prairie												
PRESENT (MINOR)												
Northeast Sands												
Northern Highland												
Northwest Sands												
Southern Lake Michigan Coastal												
Southwest Savanna												

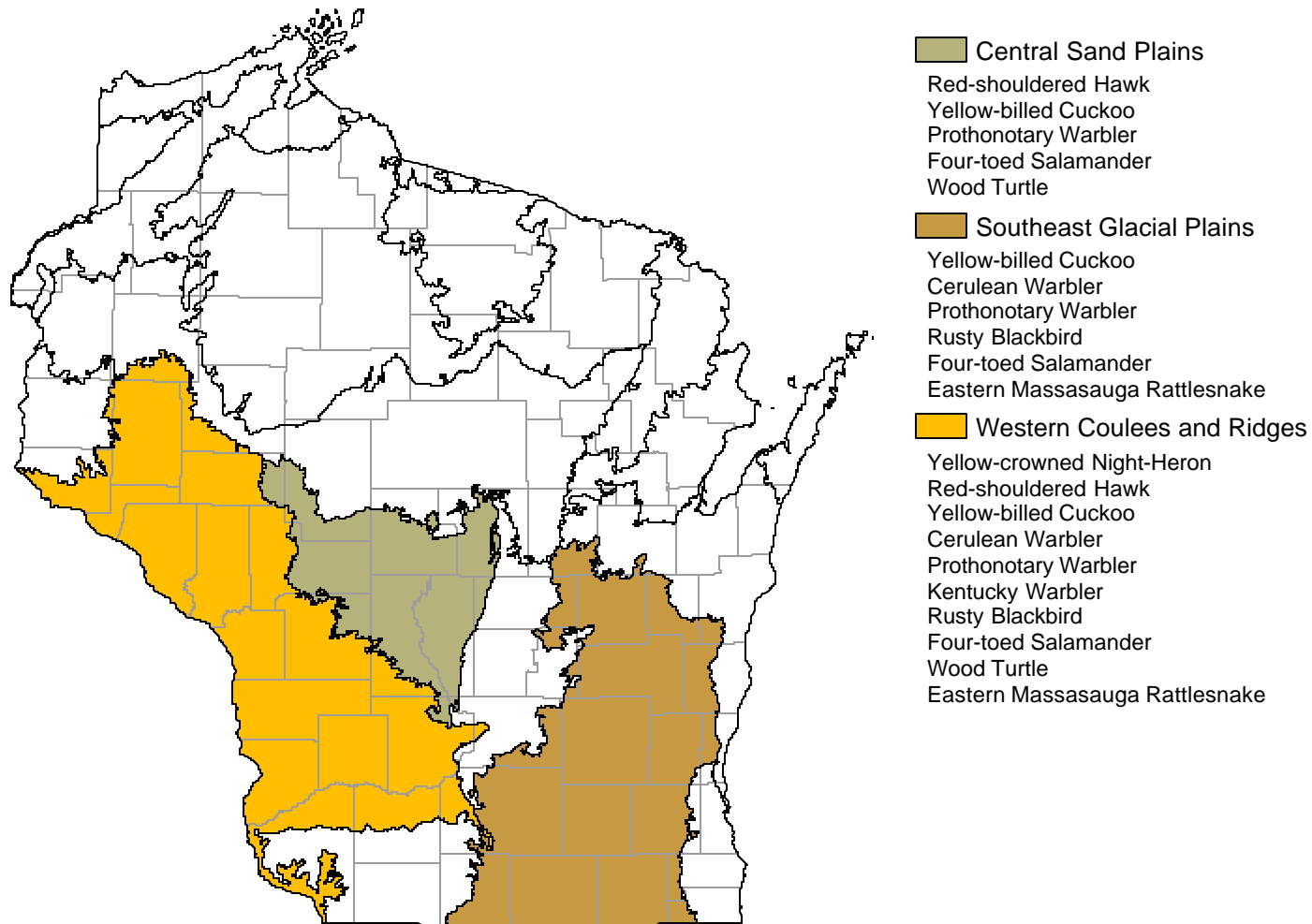
\* The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.

Table 3-147. Vertebrate Species of Greatest Conservation Need that are (or historically were) *moderately* associated with floodplain forest communities and their association with Ecological Landscapes that support floodplain forest.

Floodplain Forest	Birds (9)*									Herptiles (5)					Mammals (9)								
	Great Egret	Blue-winged Teal	Black-billed Cuckoo	Red-headed Woodpecker	Acadian Flycatcher	Least Flycatcher	Veery	Wood Thrush	Blue-winged Warbler	Pickered Frog	Blanding's Turtle	Black Rat Snake	Butler's Garter Snake	Timber Rattlesnake	Water Shrew	Northern Long-eared Bat	Silver-haired Bat	Eastern Red Bat	Hoary Bat	Northern Flying Squirrel	Woodland Jumping Mouse	Gray Wolf	Moose
MAJOR																							
Central Sand Plains																							
Southeast Glacial Plains																							
Western Coulee and Ridges																							
IMPORTANT																							
Central Lake Michigan Coastal																							
Central Sand Hills																							
Forest Transition																							
North Central Forest																							
Northern Lake Michigan Coastal																							
Superior Coastal Plain																							
Western Prairie																							
PRESENT (MINOR)																							
Northeast Sands																							
Northern Highland																							
Northwest Sands																							
Southern Lake Michigan Coastal																							
Southwest Savanna																							

\* The number shown in parentheses is the number of Species of Greatest Conservation Need from a particular taxa group that are included in the table. Taxa groups that are not shown did not have any Species of Greatest Conservation Need that met the criteria necessary for inclusion in this table.

**Figure 3-34. Vertebrate Species of Greatest Conservation Need that have both a significant association with floodplain forest and a high probability of occurring in an Ecological Landscape(s) that represents a major opportunity for protection, restoration and/or management of floodplain forest.**



### **3.3.7.2.3. Threats and Priority Conservation Actions for Floodplain Forest**

#### **3.3.7.2.3.1 Statewide Overview of Threats and Priority Conservation Actions for Floodplain Forest**

The following list of threats and priority conservation actions were identified for floodplain forest in Wisconsin. The threats and priority conservation actions described below apply to all of the Ecological Landscapes in Section 3.3.7.2.3.2 unless otherwise indicated.

##### Threats and Issues

- Hydrologic alterations of many of our major rivers due to dam and impoundment construction have changed the frequency, timing, magnitude, and duration of flood events, casting uncertainty on long-term response of the floodplain vegetation.
- Land use planning that is not comprehensive and does not emphasize conservation considerations can lead to development in locations that limit options for this community. Development in the higher portions of floodplains, or on bluff tops overlooking floodplains, can impact these forests directly, or through indirect effects of human activity (e.g. spreading invasive species, using fertilizers, increasing runoff).
- Agricultural land uses adjacent to floodplains can result in sedimentation, pollution, and erosion.
- Grazing can damage understory vegetation, including the regenerating trees.
- Conversion to other community types is occurring; e.g., dike construction can result in conversion to marsh or wet shrub communities. This has been a locally common practice in some areas to increase habitat for waterfowl.
- Among invasive species, reed canary grass has become a major problem. It rapidly increases in abundance and takes over this community type after major disturbance events such as heavy timber harvest or windthrow.
- Moneywort and creeping Charlie are now established and sometimes common in floodplain systems. Phragmites also has the potential to become established in these systems.
- Loss of overstory American elm due to Dutch elm disease has affected stand structure, as the elms were often abundant, had the potential to reach great size, and had distinctive limb architecture (such as could be observed along many city streets prior to the ravages of Dutch elm disease). In some areas the deaths of the large elms has left canopy gaps that have not yet filled with trees.
- An exotic insect, the Emerald Ash Borer, may threaten the ash component of this type, and the gypsy moth is a potential threat to oaks and perhaps other species.
- Unsustainable forest management practices can alter composition, result in the loss of forest habitat, and facilitate the spread of invasive species such as reed canary grass.
- Forest harvesting within large forest blocks can cause habitat fragmentation that reduces the value of the forest block for some interior specialists.
- More information is needed to understand how to manage this type, control or reverse the incursions of invasive species, and retain, restore, or mimic functional processes that have been lost or impaired.

##### Priority Conservation Actions

- Maintain and connect large blocks of habitat where feasible.
- Along with protection of the floodplain corridors, ecological gradients from lowlands to the uplands should also be protected. This will enlarge the amount of habitat available, allow for the movement of species upslope or downslope as environmental conditions change over time, and provide suitable habitat for those species that require large areas, or are dependent upon a mosaic of interconnected habitats for their long-term survival.
- Use buffers to protect floodplain systems from sedimentation and pollutants.

- Continued monitoring and additional research are needed to better document and understand the composition, structure, and function of floodplain systems.
- Research and further development of silvicultural systems is needed to sustainably manage and regenerate floodplain forests despite the presence of invasive species and high levels of deer herbivory.
- Continue and support research to find effective biocontrols for invasive species.
- Use management practices that do not lead to the spread of reed canary grass and other invasive species.
- The extensive floodplain forests, together with their associated large river systems, are major repositories of native diversity. To date, they have not been the subject of a large-scale planning effort that integrates ecological and conservation objectives with recreation and commodity production. Additional protection of floodplain and river systems is needed, taking into account their statewide and continental significance.

#### **3.3.7.2.3.2 Additional Considerations for Floodplain Forest by Ecological Landscape**

Special considerations have been identified for those Ecological Landscapes where major or important opportunities for protection, restoration, and/or management of floodplain forest exist. Those considerations are described below and are in addition to the statewide threats and priority conservation actions for floodplain forest found in Section 3.3.7.2.3.1.

##### Additional Considerations for Floodplain Forest in Ecological Landscapes with **Major** Opportunities for Protection, Restoration, and/or Management of Floodplain Forest

###### *Central Sand Plains*

The development of forested lowland habitat for cranberry farming has affected the Floodplain Forests of the Yellow River and its tributaries. Gravel mining occurs in some parts of the floodplain of the Black River.

There are good examples of this community type on the Black, Yellow, Lemonweir, and Wisconsin Rivers. There are areas of public ownership on the Black River State Forest, at the confluence of the Yellow and Wisconsin Rivers at Buckhorn State Park, and on the Lower Lemonweir River.

###### *Southeast Glacial Plains*

Significant opportunities for management and protection occur on the Milwaukee, lower Wolf, and Sugar Rivers, and to a lesser extent, on the Rock River at Lake Koshkonong. Public ownership is scattered and patchy.

###### *Western Coulees and Ridges*

This Ecological Landscape offers the best opportunities to manage for this community type. Large, relatively continuous areas of floodplain forest occur along the Mississippi, and the lower stretches of the Wisconsin, Chippewa, and Black Rivers. Smaller rivers are also associated with significant stands of this type, including the Red Cedar, Yellow, Hay, and Lemonweir. All of these sites are important to floodplain specialists (e.g., the prothonotary warbler) as well as many forest interior species. Public ownership is extensive at some locations, e.g., the Mississippi River (USFWS, USACOE, WDNR), the Lower Wisconsin River (WDNR), the Lower Chippewa River (WDNR), and the Lower Black River (WDNR).

Additional Considerations for Floodplain Forest in Ecological Landscapes with **Important** Opportunities for Protection, Restoration, and/or Management of Floodplain Forest

*Central Lake Michigan Coastal*

A significant part of the Lower Wolf River corridor is within this Ecological Landscape and merits strong protection. Public ownership is scattered here, and isolated rather than connected.

*Central Sand Hills*

Protection and management opportunities occur along the Wisconsin, Lower Baraboo, and Montello Rivers.

*Forest Transition*

Opportunities for management are limited here but include significant sites along the Lower St. Croix River, and some parts of the middle stretches of the Wisconsin River and its tributaries.

*North Central Forest*

This type is at the northern edge of its range in this Ecological Landscape. Opportunities are limited but there are several important occurrences and large blocks of public ownership. Existing large blocks and connectivity should be maintained where possible (e.g., along the Wisconsin, Chippewa, Jump, Yellow, and Black rivers), and managed as part of a mosaic of other forest communities.

*Northern Lake Michigan Coastal*

Opportunities are limited but there are several important occurrences. This community type should be maintained where it exists along the Lower Wolf and Peshtigo Rivers. Large occurrences of a similar community, hardwood swamp, exist in the Ecological Landscape near the west shore of Green Bay.

*Superior Coastal Plain*

Floodplain forest is at its northern range extremity here. In this Ecological Landscape the type is uncommon, and generally supports fewer species than more southerly occurrences. Floodplain corridors around the best occurrences (e.g., those on the Nemadji, Bad, and White Rivers) should be protected and maintained. Protection of high quality examples of this type would contribute significantly to the maintenance of regional diversity, as many plants have been documented on the floodplain terraces of the Superior Coastal Plain that occur in no other habitat this far north. Invasive plants are present but do not appear to be a large problem at this time. A long-term monitoring program is needed.

*Western Prairie*

The most significant sites containing this type are on the Lower St. Croix River in Polk and St. Croix Rivers. The protection level is relatively high, as this area is within the St. Croix-Namekagon National Scenic Riverway administered by the National Park Service, but recreational use of this area is very high and impacts should be monitored. Residential development on the bluffs above the floodplain has increased rapidly in recent years, and the conservation implications include the inadvertent introduction of invasive species, loss or disturbance of the forested bluffs adjoining the floodplain, and generally higher levels of human use.